

**CLAIMS**

1           **1.** A semiconductor layer, characterized by  
2 comprising:  
3           a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor;  
4 and  
5           a second layer obtained by replacing a part or all of  
6 oxygen atoms of the first layer with nitrogen atoms.

1           **2.** A semiconductor layer according to claim 1,  
2 characterized in that:  
3           the second layer is made of a GaN system compound  
4 semiconductor.

1           **3.** A semiconductor layer according to claim 1,  
2 characterized in that:  
3           the first layer is a  $\text{Ga}_2\text{O}_3$  system single crystal  
4 substrate.

1           **4.** A semiconductor layer according to claim 1,  
2 characterized in that:  
3           the first layer is made of  $\text{Ga}_2\text{O}_3$ ,  $(\text{In}_x\text{Ga}_{1-x})_2\text{O}_3$  where  $0$   
4  $\leq x < 1$ ,  $(\text{Al}_x\text{Ga}_{1-x})_2\text{O}_3$  where  $0 \leq x < 1$ ,  $(\text{In}_x\text{Al}_y\text{Ga}_{1-x-y})_2\text{O}_3$  where  
5  $0 \leq x < 1$ ,  $0 \leq y < 1$ , and  $0 \leq x + y < 1$ , or the like, as a

6 main constituent.

1       **5.** A semiconductor layer according to claim 2,  
2 characterized in that:

3       the second layer is made of GaN,  $\text{In}_z\text{Ga}_{1-z}\text{N}$  where  $0 \leq z$   
4  $< 1$ ,  $\text{Al}_z\text{Ga}_{1-z}\text{N}$  where  $0 \leq z < 1$ ,  $\text{In}_z\text{Al}_p\text{Ga}_{1-z-p}\text{N}$  where  $0 \leq z < 1$ ,  
5  $0 \leq p < 1$ , and  $0 \leq z + p < 1$ , or the like, as a main  
6 constituent.

1       **6.** A semiconductor layer, characterized by  
2 comprising:

3       a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor;  
4       a second layer made of a GaN system compound  
5 semiconductor and obtained by replacing a part or all of  
6 oxygen atoms of the first layer with nitrogen atoms; and  
7       a third layer made of an GaN system epitaxial layer  
8 and formed on the second layer.

1       **7.** A semiconductor layer, characterized by  
2 comprising:

3       a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor;  
4 and  
5       a second layer made of a GaN system compound  
6 semiconductor and formed on the first layer.

1           **8.** A semiconductor layer, characterized by  
2 comprising:  
3           a first layer made of a  $\text{Ga}_2\text{O}_3$  system semiconductor;  
4           a second layer made of a GaN system compound  
5 semiconductor and formed on the first layer; and  
6           a third layer made of an GaN system epitaxial layer  
7 and formed on the second layer.